



# SANYO

**16HA-861  
16HA-860  
15H-860**

**PORTABLE AM/FM/SW FULL-BAND RADIO**

## SERVICE MANUAL

### SPECIFICATIONS

Frequency Range .....	FM 87.5 — 108 MHz LW 150 — 350 KHz MW 515 — 1620 KHz SW1 2.3 — 5.2 MHz SW2 5.95 — 7.3 MHz SW3 9.5 — 12.5 MHz SW4 14.5 — 18.0 MHz
Intermediate Frequency .....	FM 10.7 MHz AM 455 KHz
Sensitivity (for 50mW output) .....	FM 5 $\mu$ V (30dB S/N) LW 50 $\mu$ V/m MW 25 $\mu$ V/m SW1 30 $\mu$ V/m SW2 20 $\mu$ V/m SW3 20 $\mu$ V/m SW4 3.2 $\mu$ V
Power Output .....	Undistorted 1.4W Maximum 2.0W
Power Supply .....	DC 9V, Six 1.5V "D" Batteries AC, 110V/220V for model 16HA-861 and 16HA-860
Current Drain .....	No Signal 40 mA Maximum 380 mA
Speaker .....	4" x 6" permanent dynamic type 4 ohm voice coil impedance
Dimensions .....	14½" wide x 8" high x 4¾" deep
Net Weight .....	7½ lbs.

This Manual contains information compiled from basic engineering data of model 16HA-861. Some minor changes or modifications different from contents in this manual may be found in units of latest production.

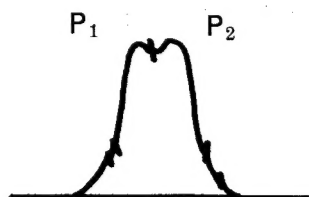
**SANYO ELECTRIC CO., LTD.**

# ALIGNMENT PROCEDURES

## Band Coverage & Tracking Alignment

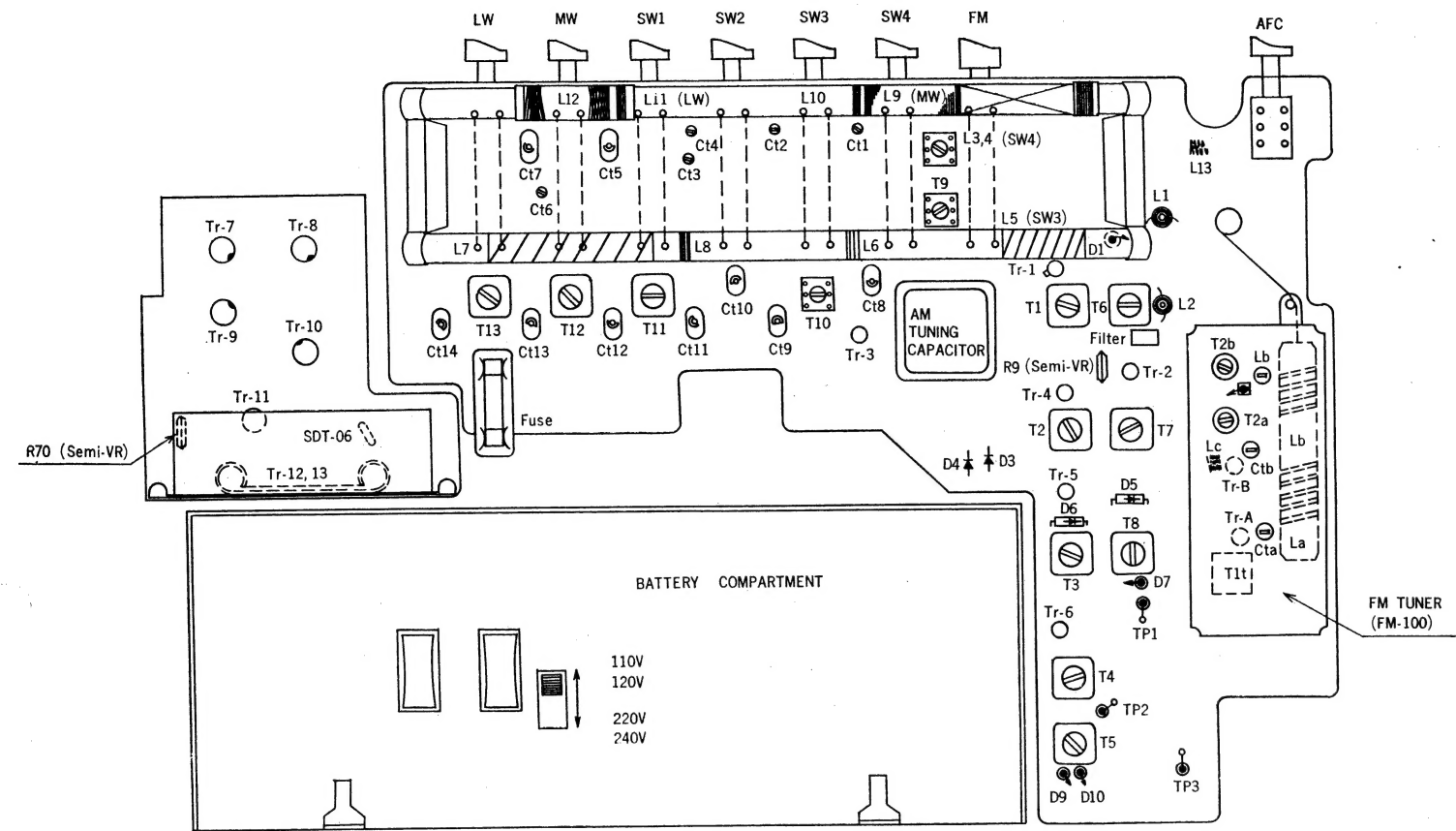
Procedures	Position of Band Switch	Signal Input	Frequency of Signal Gen.	Dial Setting of Radio	Components to be Adjusted
FM IF STAGE	FM	Dummy Ant	10.7 MC	87 MC	FM IF Transformers T4, T3, T2, T1, T2a & T2b
FM DISCRIM.	FM	Dummy Ant	10.7 MC	87 MC	FM IF Transformer T5
FM BAND COVERAGE	FM	Dummy Ant	89 MC	89 MC	Oscillator Trimmer Ctb
	FM	Dummy Ant	106 MC	106 MC	FM Oscillator Coil Lb
FM TRACKING	FM	Dummy Ant	98 MC	98 MC	FM RF Trimmer Cta
AM IF STAGE	SW1	Thru 0.1 $\mu$ F	455 KC	Lowest End	AM IF Transformer T8 T7 & T6
MW BAND COVERAGE	MW	IRE Loop	505 KC	Lowest End	MW Oscillator Coil T12
	MW	IRE Loop	1650 KC	Highest End	MW Oscillator Trimmer Ct13
MW TRACKING	MW	IRE Loop	600 KC	600 KC	MW Antenna Coil L9 L10
	MW	IRE Loop	1400 KC	1400 KC	MW Antenna Trimmer Ct6
LW BAND COVERAGE	LW	IRE Loop	145 KC	Lowest End	LW Oscillator Coil T13
	LW	IRE Loop	365 KC	Highest End	LW Oscillator Trimmer Ct14
LW TRACKING	LW	IRE Loop	160 KC	160 KC	LW Antenna Coil L11 L12
	LW	IRE Loop	340 KC	340 KC	LW Antenna Trimmer Ct7
SW1 BAND COVERAGE	SW1	IRE Loop	2.23 MC	Lowest End	SW1 Oscillator Coil T11
	SW1	IRE Loop	5.2 MC	Highest End	SW1 Oscillator Trimmer Ct12
SW1 TRACKING	SW1	IRE Loop	2.4 MC	2.4 MC	SW1 Antenna Coil L7 L8
	SW1	IRE Loop	4.7 MC	4.7 MC	SW1 Antenna Trimmer Ct5
SW2 BAND COVERAGE	SW2	IRE Loop	5.95 MC	5.95 MC	SW2 Oscillator Trimmer Ct10
	SW2	IRE Loop	7.0 MC	7.0 MC	SW2 Oscillator Trimmer Ct11
SW2 TRACKING	SW2	IRE Loop	5.95 MC	5.95 MC	SW2 Antenna Trimmer Ct3
	SW2	IRE Loop	7.0 MC	7.0 MC	SW2 Antenna Trimmer Ct4
SW3 BAND COVERAGE	SW3	IRE Loop	9.30 MC	Lowest End	SW3 Oscillator Coil T10
	SW3	IRE Loop	12.4 MC	Highest End	SW3 Oscillator Trimmer Ct9
SW3 TRACKING	SW3	IRE Loop	9.7 MC	9.7 MC	SW3 Antenna Coil L5 L6
	SW3	IRE Loop	11.7 MC	11.7 MC	SW3 Antenna Trimmer Ct2
SW4 BAND COVERAGE	SW4	Dummy Ant	14.9 MC	Lowest End	SW4 Oscillator Coil T9
	SW4	Dummy Ant	18.2 MC	Highest End	SW4 Oscillator Trimmer Ct8
SW4 TRACKING	SW4	Dummy Ant	15.5 MC	15.5 MC	SW4 Antenna Coil L3 L4
	SW4	Dummy Ant	17.7 MC	17.7 MC	SW4 Antenna Trimmer Ct1

- NOTE:**
1. Repeat OSC and RF adjustments in each Band until no further improvement is noted.
  2. Align SW2 before SW3, as any coil adjustment on SW2 will effect the adjustments on SW3.
  3. Adjust R9 (50K) semi-fixed resistor for 1.5 ma Collector current, Tr2. Use an ammeter with no less than 1000K series resistor.
  4. Never short the base of Tr2 to ground (B+) or the base of Tr11 to common (B-), to prevent damage to these transistors. Extreme care should be taken during service or alignment of this receiver to insure these shorts not be made inadvertently by a screw driver or other test equipment.
  5. R9 and R70 are both 50K ohm variable resistors. Neither of these should be set below 10K ohms whenever receiver is on, but if repair must be made to either, preset to mid range before turning receiver on.
  6. Note that FM oscillator adjustments are made contrary to normal procedure. The high end is adjusted with the coil and the low end is adjusted with the trimmer capacitor, since the tuning variables are the coils.
  7. The AM IF response curve is double peaked. If alignment is made with a sweep generator and oscilloscope adjust the IF transformers for maximum response and minimum valley. The 455KHz marker does not necessarily fall directly in the center of the response curve. A ceramic filter is used which determines the two peaks of this response curve.



RESPONSE CURVE OF AM IF STAGE

MAIN CHASSIS LAYOUT



NOTE: AC select switch and fuse are not on 15H-860

BLOCK DIAGRAM

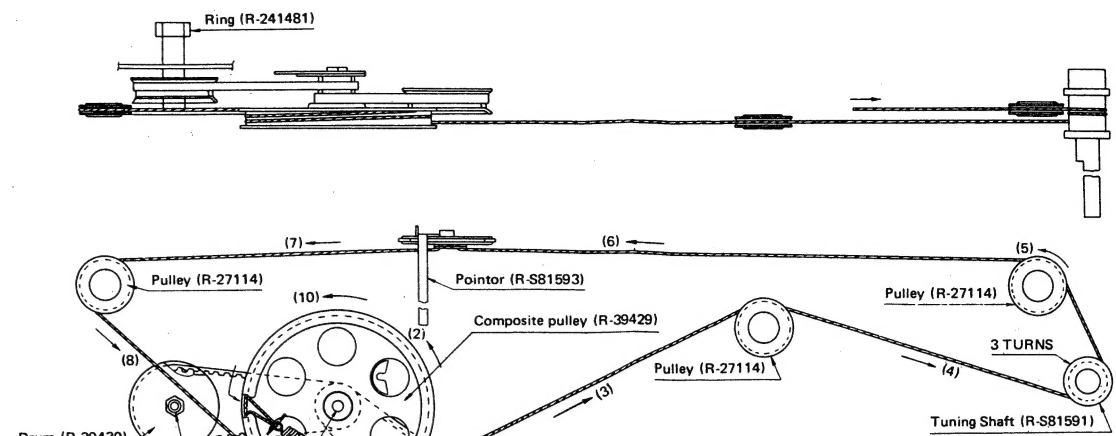
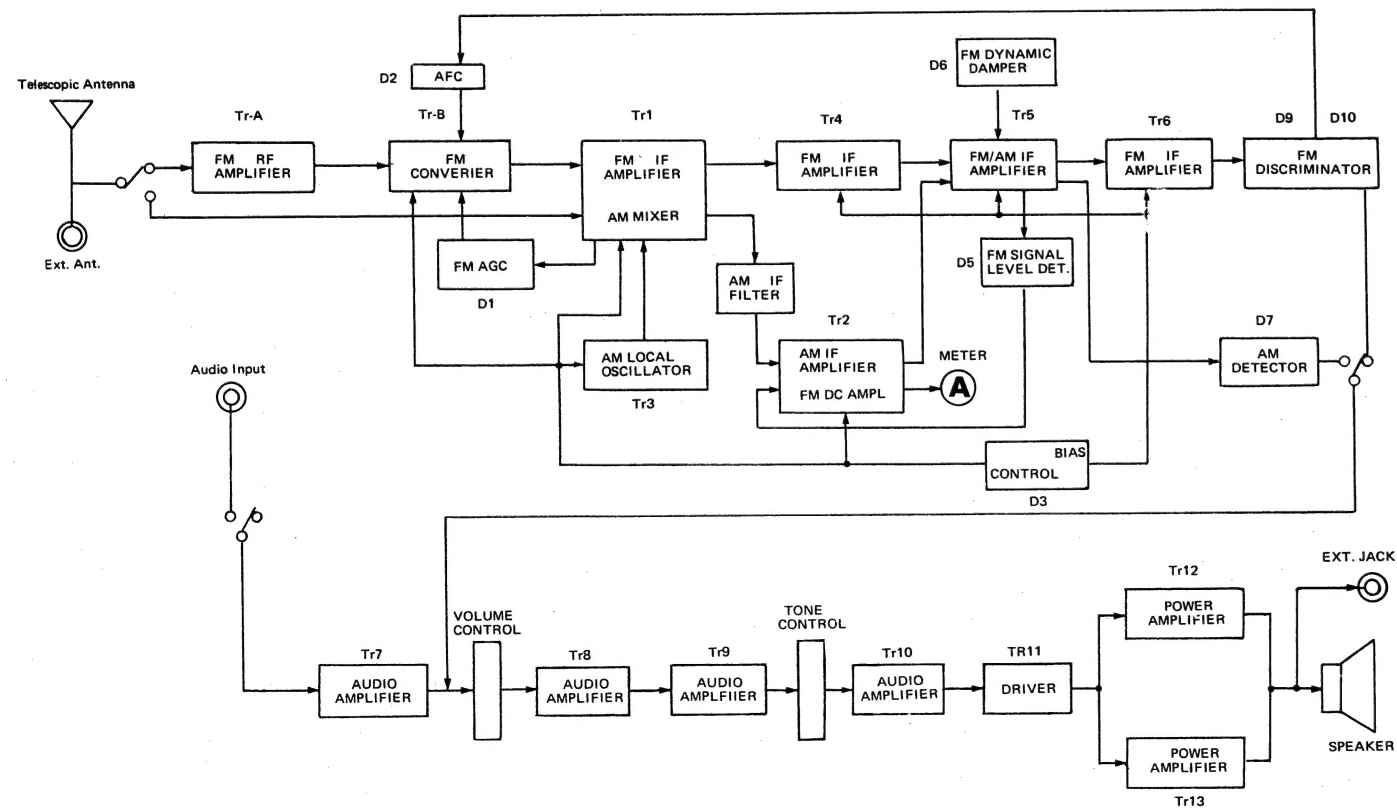


Fig. 1

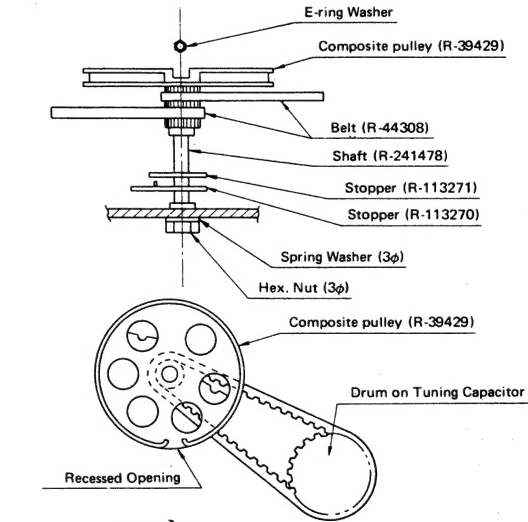


Fig. 2

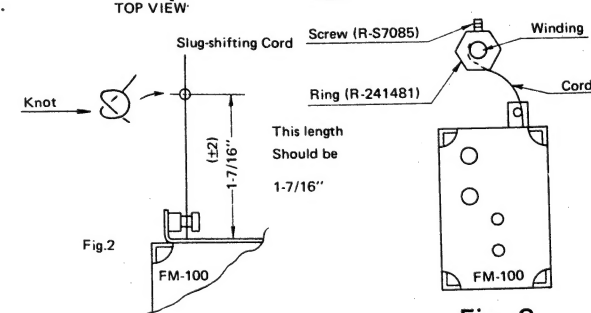


Fig. 3

INSTRUCTION FOR DIAL CORD STRINGING

- Mount Shaft (R-241478) onto chassis with Spring Washer (3φ) and Hex. Nut (3φ). Apply any lubricant onto the surface of it. Place Stopper (R-113270) and Stopper (R-113271) through Shaft, then mount Composite Pulley (R-39429) with two Belts (R-44308) attached in such a position as it's recessed opening faces downward as shown in Fig. 1 when Stoppers are hindered from swinging further by a projection on chassis.
- Mount two Drums (R-39430) temporarily onto Winding Shaft (R-S81598) and Tuning Capacitor respectively.
- One-Belt is conjugated with Drum on Tuning Capacitor in the state in which Tuning Capacitor has the minimum capacitance (been fully rotated clockwise). The other Belt is connected with Drum on Winding Shaft ordinarily without any special consideration. Then rotate Composite Pulley a full turn and check if Stopper works well without any play or not, as well as whether belt looping is correctly made with appropriate tension or not.
- Mount two Guides (R-113272) onto respective Drums with the specified screws. Be careful not to apply any notable forces onto Tuning Capacitor when fastening.
- String Dial Cord following the above illustration and locate Pointor (R-S81593) on Cord temporarily. Then place the unit into Housing and check the location of Pointor. If correctly located, fix Pointor with lacquer.
- COUPLIGN BETWEEN FM TUNER AND WINDING SHAFT**  
Set Pointor to 106MC on dial scale of FM band (Pointor Just behind the "O" letter of 106). Pull out the slug-shifting cord (for "mu" variation of coils) from FM Tuner (FM-100) fully. Mark the point on the cord which is of  $37 \pm 2$  millimeters distance measured from the metal casing. And make a knot on the marked point. (Fig. 2) Insert the cord through hole of Ring (R-241481) and tighten Screw (R-S7085) slightly. Apply FM signal of 106MC into input terminals (1 and 4) of FM-100 and adjust location of Ring on Winding Shaft in order to receive the signal loudest. Then fasten Ring with Screw tightened. (Fig. 3)



DIAL CORD STRINGING

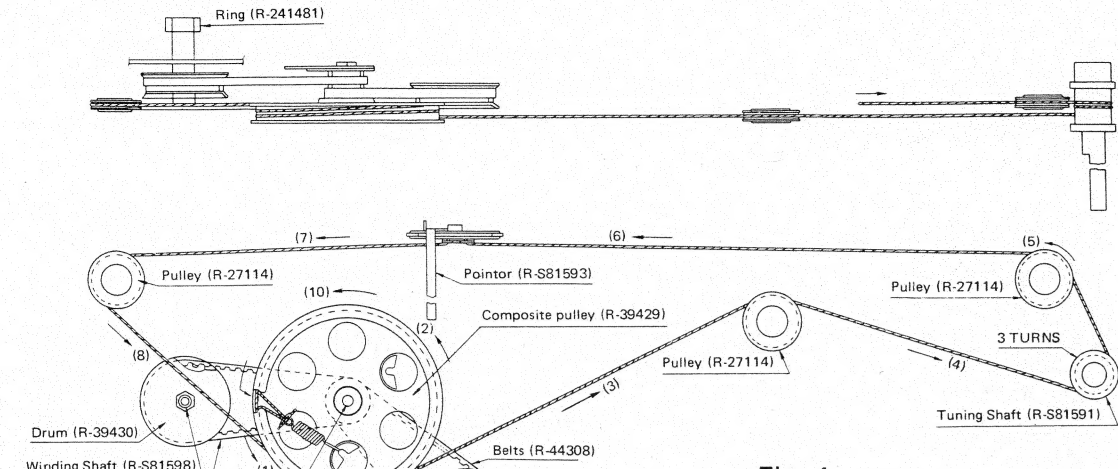


Fig. 1

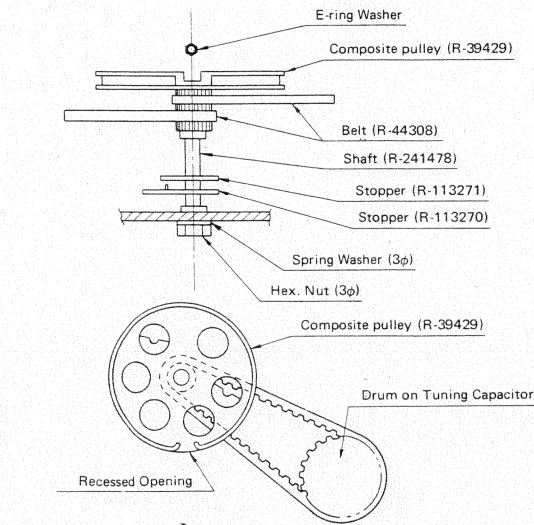


Fig. 2

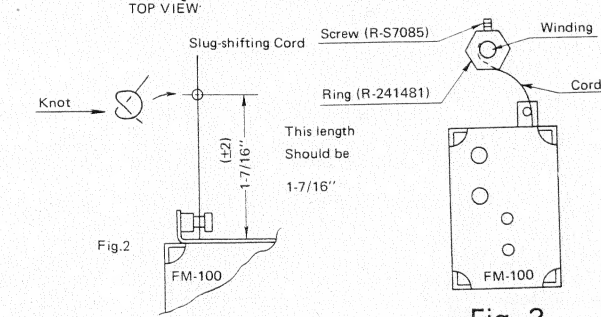
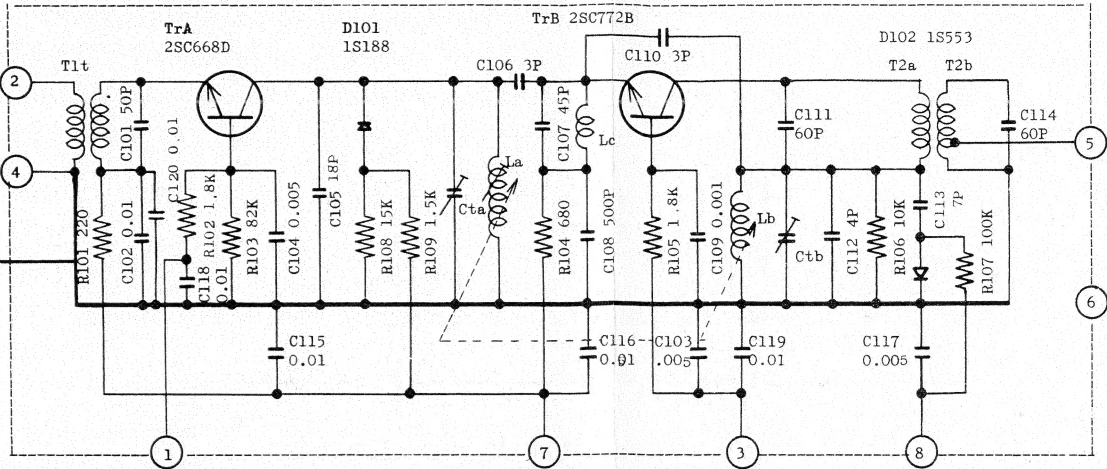


Fig. 3

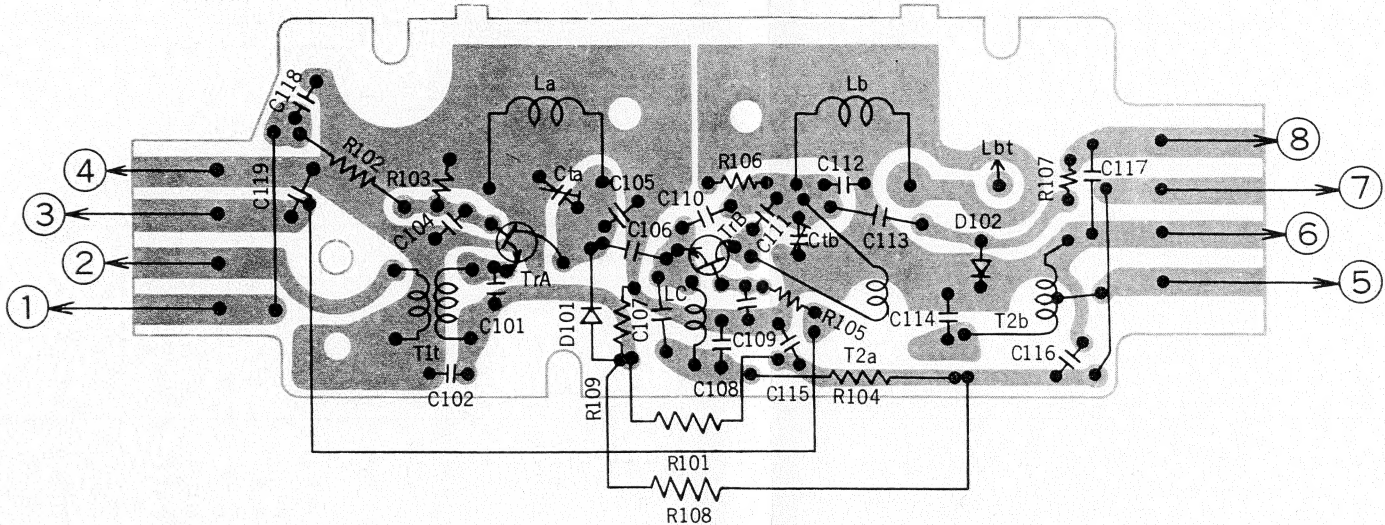
INSTRUCTION FOR DIAL CORD STRINGING

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- b) Mount two Drums (R-39430) temporarily onto Winding Shaft (R-S81598) and Tuning Capacitor respectively.
- c) One-Belt is conjugated with Drum on Tuning Capacitor in the state in which Tuning Capacitor has the minimum capacitances (been fully rotated clockwise). The other Belt is connected with Drum on Winding Shaft ordinarily without any special consideration. Then rotate Composite Pulley a full turn and check if Stopper works well without any play or not, as well as whether belt looping is correctly made with appropriate tension or not.
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Set Pointor to 106MC on dial scale of FM band (Pointor Just behind the "O" letter of 106). Pull out the slug-shifting cord (for "mu" variation of coils) from FM Tuner (FM-100) fully.  
Mark the point on the cord which is of 37 ±2 millimeters distance measured from the metal casing. And make a knot on the marked point. (Fig. 2)  
Insert the cord through hole of Ring (R-241481) and tighten Screw (R-S7085) slightly.  
Apply FM signal of 106MC into input terminals (1 and 4) of FM-100 and adjust location of Ring on Winding Shaft in order to receive the signal loudest. Then fasten Ring with Screw tightened. (Fig. 3)

FM TUNER (FM-100)  
SCHEMATIC DIAGRAM



INTER-PARTS WIRING ILLUSTRATION

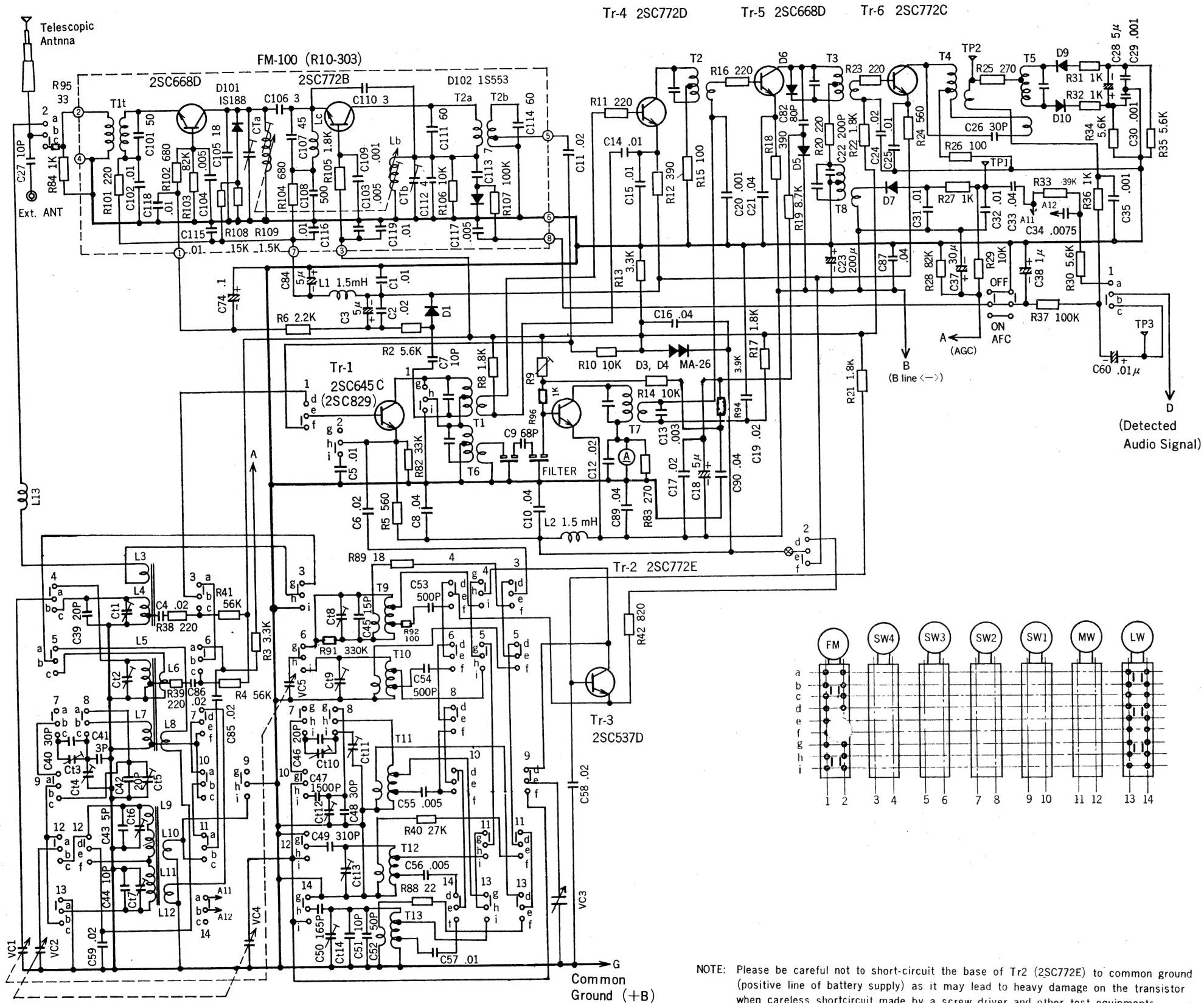


COMPONENT PARTS

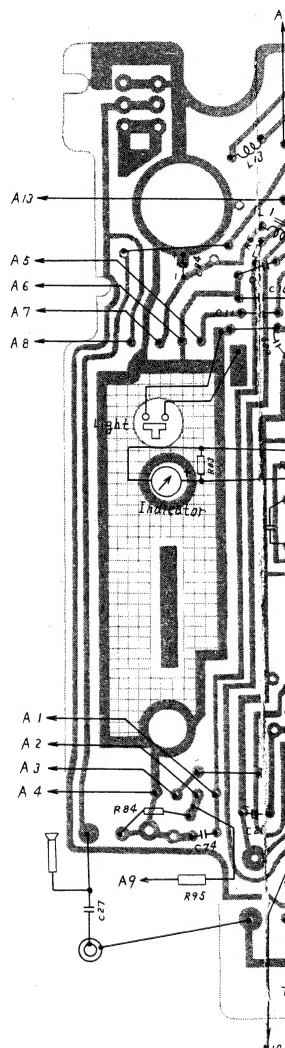
Schematic Location	Part No.	Description	Schematic Location	Part No.	Description
FIXED VALUE CAPACITOR					
La Lb	R-113353a	Shield Case	C101	R-CKD500K	Ceramic 50pF ±10%
	R-113354d	Bottom Casing	C102 C115	R-CKD103Z	Ceramic 0.01μF +80%
	R-113355a	Metal Mount - guide mtg	C116 C118		
	R-241522	Guide Shaft	C119		
	R-241523	Guide	C103 C104	R-CKD502Z	Ceramic 0.005μF +80%
	R-S81668	Variable Inductance Coil Assembly	C117		
	R-S81679	Ferrite Slug	C105	R-CKD180K	Ceramic 18pF ±10%
	R-35314	Bobbin	C106 C110	R-CKD030J	Ceramic 3pF ±0.25pF
	R-35315	Stopper	C107	R-CKD450K	Ceramic 45pF ±10%
	R-15330	Tension Spring	C108	R-CKD501M	Ceramic 500pF ±20%
T1t Lc T2a T2b Cta Ctb TrA TrB D101 D102	R-	Special Head Machine Screw 3x6	C109	R-CKD102M	Ceramic 0.001μF ±20%
	R-W2365	Antenna Coil	C111 C114	R-CKD600K	Ceramic 60pF ±10%
	R-W1069	Choke Coil 0.6uH 16 turns	C112	R-CKD040K	Ceramic 4pF ±0.5pF
	R-W5W032	IF Transformer	C113	R-CKD070K	Ceramic 7pF ±0.5pF
	R-C0064	Cylinder Trimmer	FIXED VALUE RESISTORS		
	2SC668D	Transistor	R101	R-R221J	220 ohms ±5% 1/4W
	2SC772B	Transistor	R102	R-R681K	680 ohms ±10% 1/4W
	1S188	Diode (for FM use)	R103	R-R823J	82K ohms ±5% 1/4W
	1S553	Diode (variable capacitance)	R104	R-R681J	680 ohms ±5% 1/4W
	R-41712	Printed Circuit Board	R105	R-R182K	1.8K ohms ±10% 1/4W
			R106	R-R103K	10K ohms ±10% 1/4W
			R107	R-R104K	100K ohms ±10% 1/4W
			R108	R-R153K	15K ohms ±10% 1/4W
			R109	R-R152K	1.5K ohms ±10% 1/4W

SCHEMATIC DIAGRAM  
(RF and IF Stages)

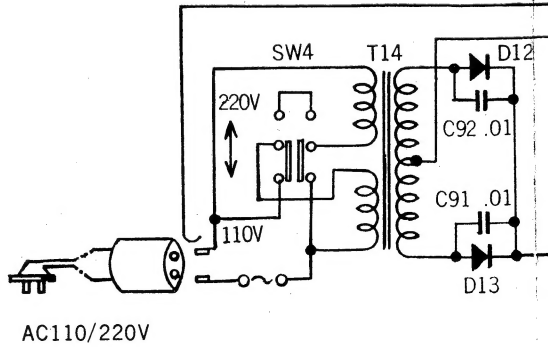
INTER-PARTS WIRING ILLUSTRATION  
(RF and IF Stages)



NOTE.  
All resistance values in "ohms" K=1,000 ohms.  
All capacitance values in "μF" P=pF.



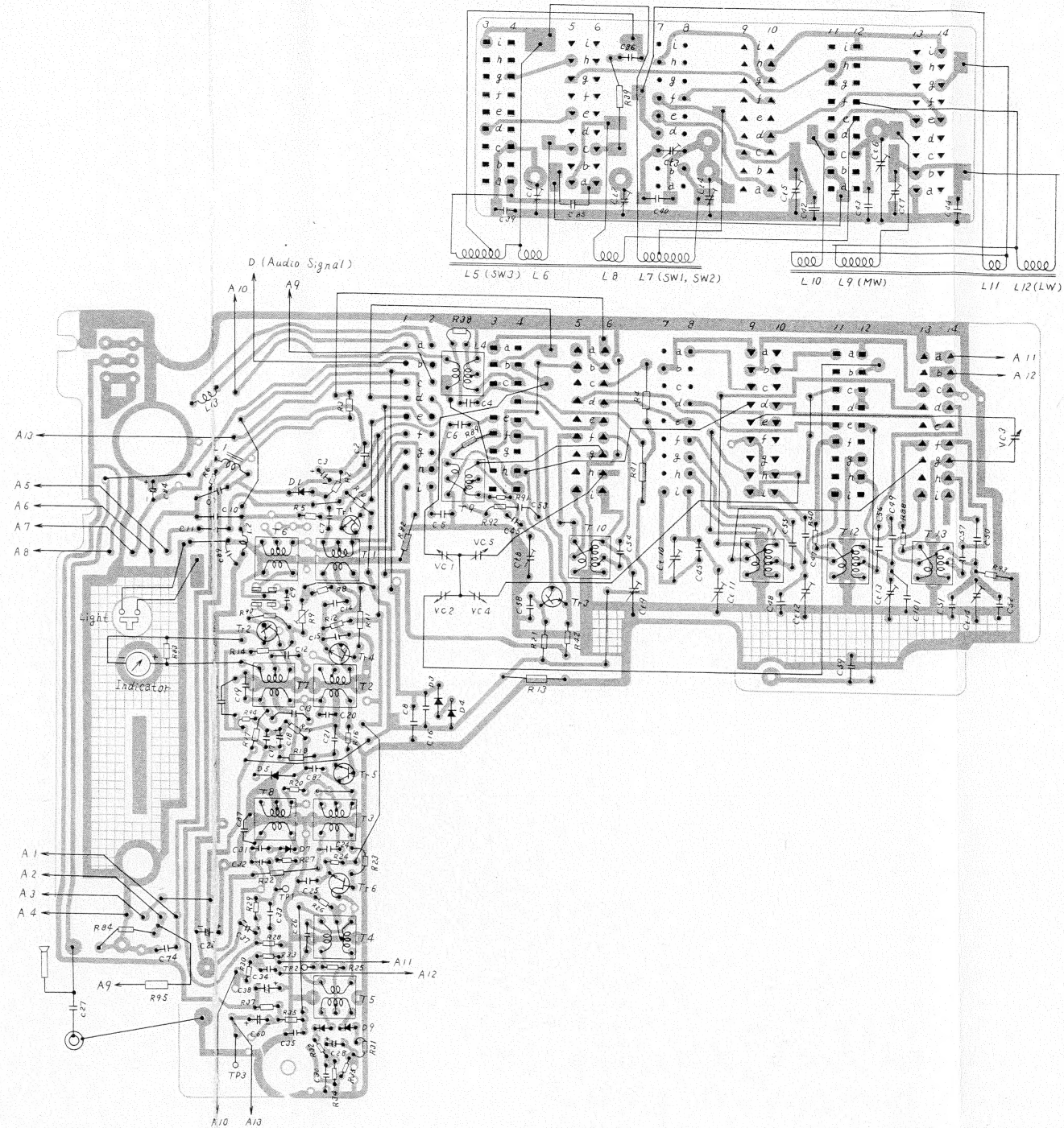
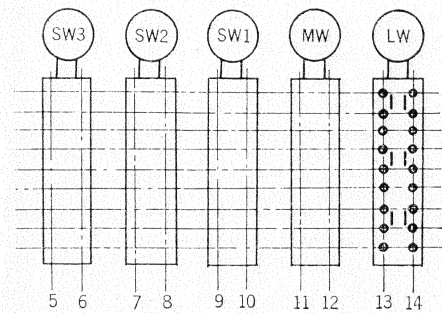
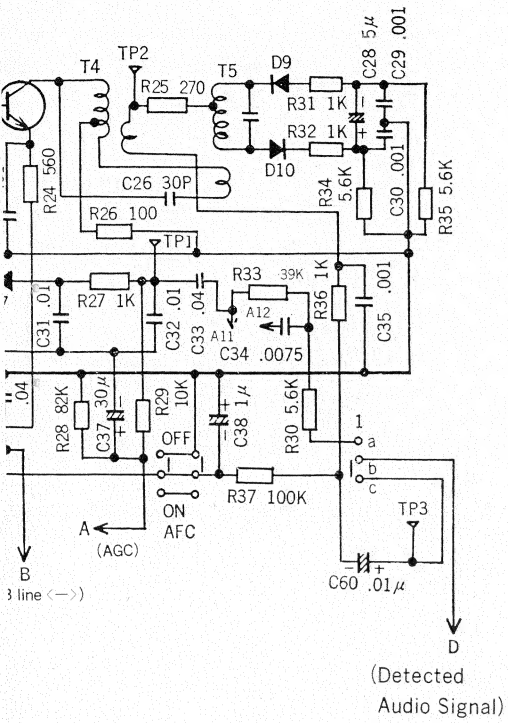
AC CONVERTER (16 HA-861 & 16 HA-860)



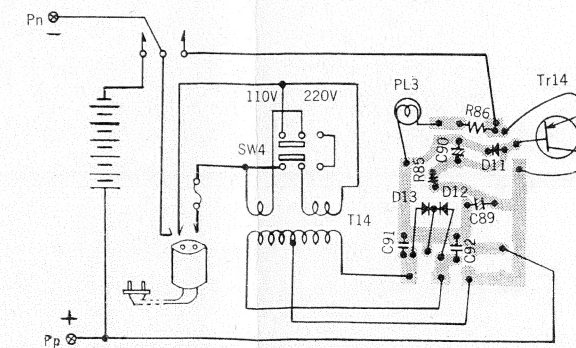
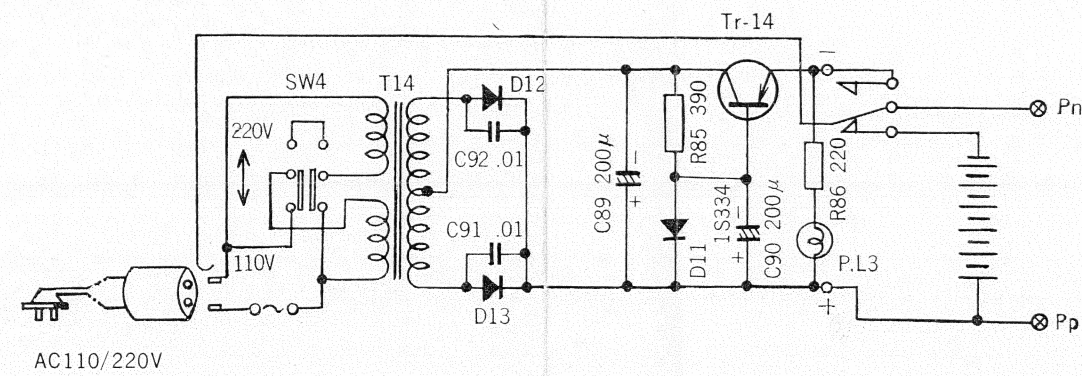


# INTER-PARTS WIRING ILLUSTRATION (RF and IF Stages)

2SC772C

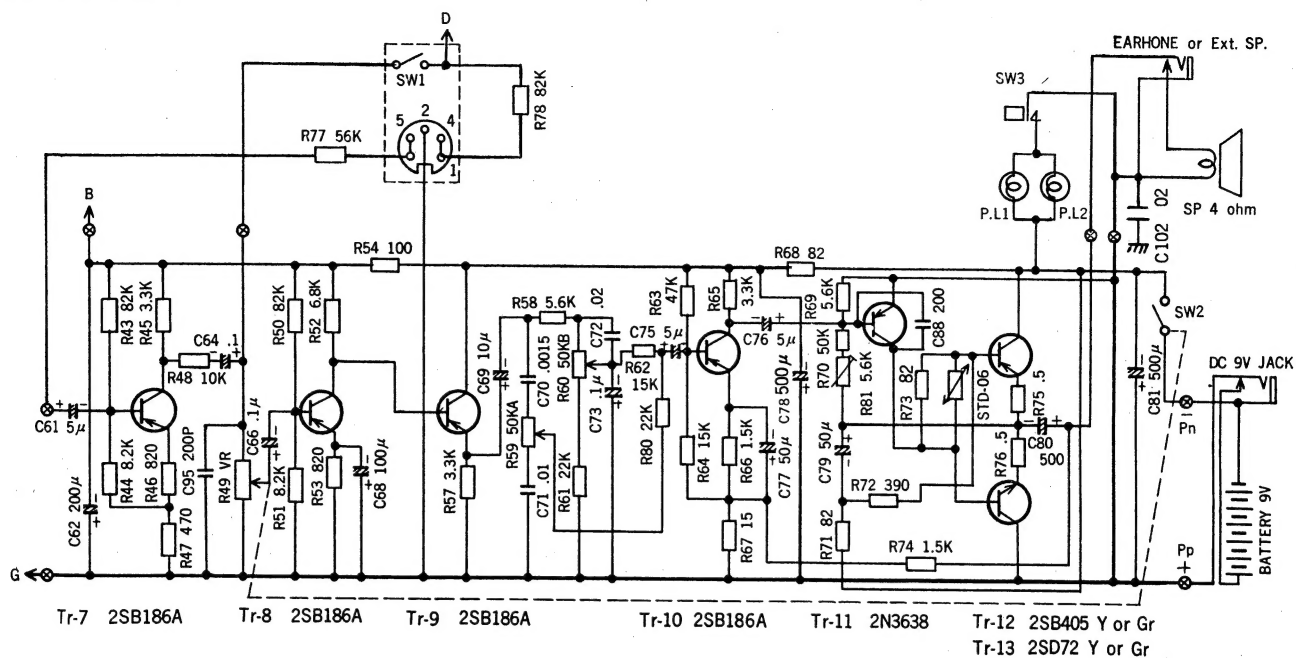


## AC CONVERTER (16 HA-861 & 16 HA-860)



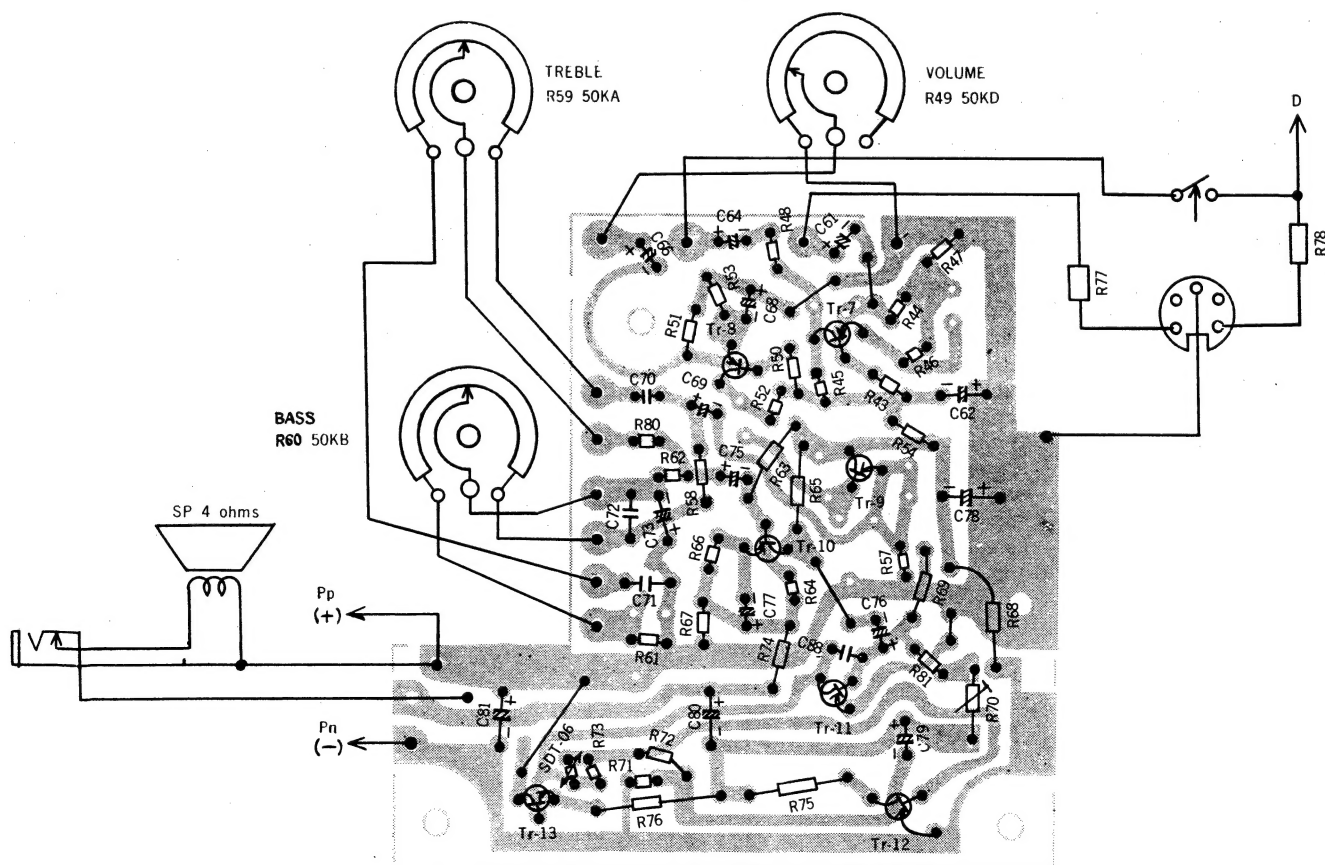
ircuit the base of Tr2 (2SC772E) to common ground as it may lead to heavy damage on the transistor by a screw driver and other test equipments.

## SCHEMATIC DIAGRAM (Audio Stages)



NOTE: Please be careful not to short-circuit the base of Tr11 (2N3638) to common line (negative line of battery supply) as it may lead to heavy damage on the transistor when careless shortcircuit made by a screw driver and other test equipments.

## INTER-PARTS WIRING ILLUSTRATION (RF and IF Stages)



# PARTS LIST

Part No.	Description	Q'ty	Part No.	Description	Q'ty
<b>CABINET</b>			<b>CHASSIS</b>		
R-A	Cabinet Assembly, model 16HA-861	1	R-S81600	Push Button, band selector	8
R-A	Front Housing Assembly, model 16HA-861	1	R-424397	Insulation Sheet, for band selector switch	1
R-32776e	Front Housing	1	R-424398	Insulation Sheet, for AFC switch	1
R-311239	Plastic Grille, speaker grille	1	R-S81591	Tuning Shaft, AM tuning	1
R-27166	Badge	1	R-S7089	Special Nut, tuning shaft mtg.	1
R-262276	Badge	1	R-S81598a	Tuner Shaft, FM tuning	1
R-38261	Dial Scale	1	R-241481	Ring, on tuner shaft	1
R-113263	Metal Mount, front & back liaison	2	R-S7085	Screw, ring mtg.	1
R-43169	Cloth, plastic grille lining	1	R-39429a	Composite Pulley	1
R-S7088	Special Screw, speaker mtg	2	R-241478	Shaft, composite pulley mtg. ISO	1
R-12059a	Speed Washer, indicator mtg	2	R-113270	Stopper Metal, composite pulley lock	1
R-261992	Eyelet, on dial scale	2	R-113271	Stopper Metal, composite pulley lock	1
R-Y	Hex/Head Screw 3 x 10,	4	R-15041	Tension Spring, dial cord stringing	1
R-Y	Hex. Nut 3φ	4	R-39430a	Drum	2
R-A	Back Housing Assembly, model 16HA-861	1	R-44308	Belt, drum driving	2
R-31904d	Back Housing	1	R-113272	Guide, drum	2
R-262004a	Marking Metal, EAR EXT SP	1	R-S7083	Special Screw, drum mtg.	1
R-261865	Marking Metal, EXT ANT	1	R-27114	Pulley	3
R-261863	Top Metal, push button identify	1	R-	Dial Cord, tetron 0.5φ 1000mm long	1
R-S81597a	World Time Zone Map	1	R-44065	Cushion, tuning capacitor mtg.	1
R-31985	Clear Plastic Disc	1	R-S7090	Special Nut, fine tuning cap. mtg.	1
R-S7077	Special Screw	2	R-44004	Cushion, pilot lamp mtg.	1
R-S3008	Lug	2	R-113352	Metal Mount, pilot lamp mtg.	1
R-472074	Specification Sheet, 16HA-861	1	R-31905	Back Ground, dial scale	1
R-A16860	Cabinet Assembly, model 16HA-860	1	R-113261	Slide Rail	1
R-A32776	Front Housing Assembly, model 16HA-860	1	R-39428f	Plastic Chassis	1
R-32776	Front Housing	1	R-39455	Holder, antenna coil mtg.	2
R-31910a	Plastic Grille, speaker grille	1	R-25317	Terminal, contact for battery compartment	2
R-27109	Sadge, SANYO Campannette	1	R-12472	Coiled Spring, terminal mtg.	2
R-38159d	Dial Scale	1	R-31986	Guide, AC input	1
R-113263	Metal Mount, front & back liaison	2	R-241507	Metal Mount, terminal mtg.	2
R-S7083	Special Screw, speaker mtg.	4	R-262047	Sleeve	1
R-12059a	Speed Washer, badge mtg.	5	R-262005	Heat Sink	1
R-A31904a	Back Housing Assembly, model 16HA-860	1	R-27108a	Stud Nut, chassis mtg.	3
R-31904d	Back Housing	1	R-41668a	Printed Circuit Board, main	1
R-262004a	Marking Metal, EAR, EXT SP & other lettering	1	R-41715a	Printed Circuit Board, AC rectifier	1
R-261865	Marking Metal, EXT. ANT lettering	1	R-41674a	Printed Circuit Board, band switch	1
R-261863a	Top Metal, push button identify	1	R-41669b	Printed Circuit Board, audio stage	1
R-S81597a	World Time Zone Map	1	R-	Ethylene Washer 12φx6φx0.5t, earphone jack	1
R-31985	Clear Plastic Disc	1	R-	Fiber Washer 10φx4.3φx1t, heat sink	2
R-S7077	Special Screw, AUTO ANT Jack mtg.	2	<b>MISCELLANEOUS</b>		
R-424355	Compartment, accessory	1	R-S1332	Telescopic Antenna	1
R-113384	Metal Reinforcer	1	R-S6449	Speaker, 4" x 8" 4 ohms	1
R-113385	Metal Reinforcer	1	R-S5547a	Indicator, 600 uA full scale	1
R-471658	Specification Sheet, model 16HA-860	1	R-S1331a	Ceramic Filter, SF-455D	1
R-A15860	Cabinet Assembly, model 15H-860	1	R-S6365	Earphone	1
R-A32776	Front Housing Assembly, model 15H-860	1	R-S1287	Pilot Lamp, 9V 30mA	3
R-A31904	Back Housing Assembly, model 15H-860	1	R-S81332	Jack with Switch, AC input	1
R-471569	Specification Sheet, model 15H-860	1	R-S2139	Jack, earphone	1
R-31907	Lid, battery compartment	1	R-S2179	Jack, phono & play	1
R-31908	Lid, accessory compartment	1	R-S2155	Jack, antenna	1
R-S81595	Handle	1	R-S261996	Heat Sink	1
R-241472d	Thumb Screw, handle mtg.	2	R-261866a	Heat Sink	1
R-28164	Special Washer, handle mtg.	2	R-28085	Heat Sink, 2SB492	1
R-	Polyethylene Washer 15φx10.2φx0.3t	2	R-S81599	Battery Compartment	1
R-	Vinyl Washer 15φx10.2φx1t	2	R-S3146	AC Cord	1
R-S81592	Knob, tuning control	2	R-S8575b	Plug Adaptor, England type 2 pin	1
R-S81594	Knob	4	R-S8574b	Plug Adaptor, German type 2 pin	1
R-S81593a	Pointer	1	R-S1325	Fuse Holder	1
R-424355	Compartment, accessory	1	R-S1320	Fuse, 0.2A	1
R-113384a	Metal Reinforcer	1	R-S3209	Lead & Plug, antenna	1
R-113385a	Metal Reinforcer	1	R-S3049	Lug Terminal	2
R-12473	Metal Mount, dial illumination	2	R-S3063	Terminal	2
R-113414a	Shielding Plate, for oscillator coil	1	R-S3232	Test Point	3
R-S3063	Lug	1	R-12011	Lug, lead clamp	2
			R-S3008	Lug, lead clamp	1
			R-23676	Lug, telescopic antenna	1
			R-23899	Lug, grounding of volume control	1



# PARTS LIST

SCHEMATIC LOCATION	Part No.	Description	SCHEMATIC LOCATION	Part No.	Description
<b>CONTROLS</b>			<b>COILS &amp; TRANSFORMERS</b>		
R9 R70 R49	FM-100 R-C1152	FM Tuner Assembly Variable Capacitor, AM tuning capacitor	L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12	R-W1059a R-W2353 R-W2352 R-W2351	Choke Coil, 1.5mH Antenna Coil, SW4 Antenna Coil, SW1 SW2 SW3 Antenna Coil, LW MW
R59	R-C1146 R-C0058a R-R11010 R-R124187	Variable Capacitor, Fine tuning Trimmer Capacitor Semi-fixed Resistor, 50K Variable Resistor, 50K volume control	T1 T2 T3 T4 T5 T6 T7 T8 T9	R-W5T346 R-W5T292 R-W5T237 R-W5T008-3 R-W5T239 R-W5T327-3 R-W8264	IF Transformer, FM IF Transformer, FM IF Transformer, FM IF Transformer, AM IF Transformer, AM Oscillator Coil, SW4
R60	R-R11692	Variable Resistor, 50KB treble control	T10 T11 T12 T13 T14 L13	R-W8263 R-W8262a-3 R-W8220a-3 R-W8219 R-W7128 R-W9062	Oscillator Coil, SW3 Oscillator Coil, SW2 Oscillator Coil, SW1 Oscillator Coil, MW Step-down Transformer, AC power VHF Coil
Ct1 Ct2	R-R11693	Variable Resistor, 50KA bass control			
	R-C0050a R-S4424 R-S4425b R-S4426 R-S4439	Trimmer Capacitor Push Button Switch, band selector Push Switch, pilot switch Push Switch, AFC Slide Switch			
<b>SEMICONDUCTORS</b>			<b>CAPACITORS</b>		
Tr1	2SC645C or 2SC829C	Transistor, AM converter	C1 C5 C14 C15 C25, C91 C92	R-CKS103Z	Ceramic 0.01μF +80% 50V
Tr2	2SC772E	Transistor	C2 C11 C12 C17 C19 C58 C102	R-CKD203Z	Ceramic 0.02μF +80% 50V
Tr3 Tr4	2SC772D	Transistor	C3 C8 C28 C61 C75 C76 C84	R-C9882	Electrolytic 4.7μF 6.3V
Tr5 Tr6	2SC772C	Transistor	C4 C6 C24 C59 C72 C85 C86	R-CQS203M	Mylar 0.02μF ±20% 50V
Tr7 Tr8 Tr9 Tr10	2SB186A	Transistor	C7 C27 C44	R-CKD100K	Ceramic 10pF ±10% 50V
Tr11	2N3638	Transistor	C8 C10 C16 C21 C87 C89 C90	R-CKD403Z	Ceramic 0.04μF +80% 50V
Tr12	2SB405	Transistor, orange mark	C9	R-CKS680J	Ceramic 68pF ±5% 50V
Tr13	2SD72	Transistor, orange mark	C13	R-CQS302M	Mylar 0.003μF ±20% 50V
Tr14	2SB492	Transistor	C20 C29 C30 C35	R-CQS102M	Mylar 0.001μF ±20% 50V
D1 D5 D6 D7	1S188AM	Diode	C22 C88 C95	R-CKS201K	Ceramic 200pF ±10% 50V
D3 D4	MA-26	Diode, silicon	C23 C62 C90	R-C9877	Electrolytic 220μF 10V
D9 D10	1S188D	Diode, FM discriminator	C26 C48	R-CKS300K	Ceramic 30pF ±10% 50V
D11	1S334	Zener Diode, 8.9 ~9.6V			
	R-S1347	Silicon Rectifier, 1S1849			
	SDT-06	Thermistor			
<b>RESISTORS</b>					
R2 R30 R34 R35 R58 R69 R81	R-R562K	5.6K ohms ±10% ¼W	C31 C32 C57 C71 C33 C34 C37 C38 C39 C46	R-CQS103M R-CQS403M R-CQS752M R-C9881 R-C9203 R-CKD200K	Mylar 0.01μF ±20% 50V Mylar 0.04μF ±20% 50V Mylar 0.0075μF ±20% 50V Electrolytic 33μF 6.3V Electrolytic 1μF 10V Ceramic 20pF ±10% 50V
R3 R13 R45 R57 R65	R-R332K	3.3K ohms ±10% ¼W	C40 C42 C45	R-CKS200K R-CKD150K	Ceramic 20pF ±10% 50V Ceramic 15pF ±10% 50V
R4 R41 R77 R5 R24 R6	R-R563K R-R561K R-R222K	56K ohms ±10% ¼W 560 ohms ±10% ¼W 2.2K ohms ±10% ¼W	C47 C49 C50 C51	R-CQT152K R-CQT311K R-CQT162K R-CKD100K	Styrol 1500pF ±10% 35V Styrol 310pF ±10% 35V Styrol 165pF ±10% 35V Ceramic 10pF ±10% 50V
R8 R17 R21 R22 R10 R14 R29 R48 R11 R16 R23 R38 R20 R39 R86	R-R182K R-R103K R-R221K	1.8K ohms ±10% ¼W 10K ohms ±10% ¼W 220 ohms ±10% ¼W	C52 C53 C54 C55 C56 C60 C64 C66 C73 C74	R-CKS500J R-CKS501M R-CQS502M R-C9126	Ceramic 50pF ±5% 50V Ceramic 500pF ±20% 50V Mylar 0.005μF ±20% 50V Electrolytic 0.1μF 10V
R12 R18 R72 R85 R15 R26 R54 R92 R19	R-R391K R-R101K R-R272K	390 ohms ±10% ¼W 100 ohms ±10% ¼W 2.7K ohms ±10% ¼W	C68 C69 C70 C78 C80 C81 C77 C79 C82 C89 C101	R-C9134 R-C9145 R-CQS152M R-C9905 R-C9903 R-CKS800J R-C9222 R-CKD050J	Electrolytic 100μF 10V Electrolytic 10μF 10V Mylar 0.0015μF ±20% 50V Electrolytic 470μF 10V Electrolytic 47μF 10V Ceramic 80pF ±5% 50V Electrolytic 220μF 25V Ceramic 5pF ±0.25pF 50V
R25 R83 R27 R31 R32 R36 R84 R90	R-R271K R-R102K	270 ohms ±10% ¼W 1K ohms ±10% ¼W			
R28 R43 R50 R78 R33 R37 R40	R-R823K R-R393K R-R104K R-R270K	82K ohms ±10% ¼W 39K ohms ±10% ¼W 100K ohms ±10% ¼W 27 ohms ±10% ¼W			
R42 R46 R53 R44 R51 R47 R52	R-R821K R-R822K R-R471K R-R682K	820 ohms ±10% ¼W 8.2K ohms ±10W ¼W 470 ohms ±10% ¼W 6.8K ohms ±10% ¼W			
R61 R80 R62 R64 R63 R66 R74 R67	R-R223K R-R153K R-R473K R-R152K R-R150K	22K ohms ±10% ¼W 15K ohms ±10% ¼W 47K ohms ±10% ¼W 1.5K ohms ±10% 1/4W 15 ohms ±10% ¼W			
R68 R71 R73 R75 R76 R82 R88 R89 R91 R93 R94 R95	R-R820K R-RON5K R-R333K R-R220K R-R180K R-R334K R-R124K R-R392K R-R330K	82 ohms ±10% ¼W 0.5 ohm ±10% -W 33K ohms ±10% ¼W 22 ohms ±10% ¼W 18 ohms ±10% ¼W 330K ohms ±10% ¼W 120K ohms ±10% ¼W 3.9K ohms ±10% ¼W 33 ohms ±10% ¼W			

## HOW TO ORDER REPLACEMENT PARTS

All parts listed herein may be ordered through our SERVICE DEPARTMENT of SANYO ELECTRIC TRADING CO., LTD. or Sanyo authorized service stations or agents. When ordering parts by mail parts will be shipped at prevailing prices and you will be billed accordingly.

WHEN ORDERING REPLACEMENT PARTS, ALWAYS GIVE THE FOLLOWING INFORMATION AS SHOWN IN THIS LIST:

1. The PART NUMBER.
2. The PART NAME or DESCRIPTION.
3. The MODEL NUMBER 16HA-861

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